

RUJUKAN

Students' Learning Style of School of Medical Sciences, Universiti Sains Malaysia

(USM short term grant No. 304/PDSD/6131433)



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# Content

				Pages
<b>Summary</b>	...	...	...	<b>1-2</b>
<b>Introduction</b>	...	...	...	<b>3-4</b>
<b>Objective</b>	...	...	...	<b>4</b>
<b>Methodology</b>	...	...	...	<b>5-7</b>
<b>Study population</b>	...	...	...	<b>5</b>
<b>Study instrument</b>	...	...	...	<b>5</b>
<b>Validity and reliability of the VARK inventory</b>			...	<b>6</b>
<b>Data Collection</b>	...	...	...	<b>6</b>
<b>Analysis</b>	...	...	...	<b>7</b>
<b>Duration</b>	...	...	...	<b>7</b>
<b>Outcome</b>	...	...	...	<b>7</b>
<b>Results</b>	...	...	...	<b>8-14</b>
<b>Discussion</b>	...	...	...	<b>15-16</b>
<b>Conclusion and recommendations</b>	...		...	<b>17</b>
<b>Acknowledgement</b>		...	...	<b>17</b>
<b>References</b>		...	...	<b>18-19</b>
<b>Appendix A -VARK learning style questionnaire</b>				
<b>Appendix B – VARK learning style analysis instruction</b>				
<b>Appendix C – Permission Letter from Dr. N.D. Fleming</b>				
<b>Appendix D- Manuscript on the study</b>				

# LAPORAN AKHIR PROJEK PENYELIDIKAN JANGKA PENDEK FINAL REPORT OF SHORT TERM RESEARCH PROJECT

Sila kemukakan laporan akhir ini melalui Jawatankuasa Penyelidikan di Pusat Pengajian dan Dekan/Pengarah/Ketua Jabatan kepada Pejabat Pelantar Penyelidikan

1. Nama Ketua Penyelidik:  
Name of Research Leader PM DR. ARUNODAYA BARMAN  
☒ Profesor Madya/  
Assoc. Prof. ☐ Dr./  
Dr. ☐ Encik/Puan/Cik  
Mr/Mrs/Ms
2. Pusat Tanggungjawab (PTJ): School of Medical Sciences/ Department of Medical Education  
School/Department
3. Nama Penyelidik Bersama: PROF. DR. ROGAYAH JAAFAR  
Name of Co-Researcher
4. Tajuk Projek:  
Title of Project *Students' Learning Style of School of Medical Sciences, Universiti Sains Malaysia*

## 5. Ringkasan Penilaian/Summary of Assessment:

	Tidak Mencukupi Inadequate		Boleh Diterima Acceptable	Sangat Baik Very Good	
	1	2	3	4	5
i) Pencapaian objektif projek: Achievement of project objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Kualiti output: Quality of outputs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii) Kualiti impak: Quality of impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv) Pemindahan teknologi/potensi pengkomersialan: Technology transfer/commercialization potential	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v) Kualiti dan usahasama : Quality and intensity of collaboration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vi) Penilaian kepentingan secara keseluruhan: Overall assessment of benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**6. Abstrak Penyelidikan**

(Perlu disediakan di antara 100 - 200 perkataan di dalam Bahasa Malaysia dan juga Bahasa Inggeris. Abstrak ini akan dimuatkan dalam Laporan Tahunan Bahagian Penyelidikan & Inovasi sebagai satu cara untuk menyampaikan dapatan projek tuan/puan kepada pihak Universiti & masyarakat luar).

**Abstract of Research**

(An abstract of between 100 and 200 words must be prepared in Bahasa Malaysia and in English).

This abstract will be included in the Annual Report of the Research and Innovation Section at a later date as a means of presenting the project findings of the researcher/s to the University and the community at large)

Given

**7. Sila sediakan laporan teknikal lengkap yang menerangkan keseluruhan projek ini.**

[Sila gunakan kertas berasingan]

Applicant are required to prepare a Comprehensive Technical Report explaining the project.

(This report must be appended separately)

Appended

Senaraikan kata kunci yang mencerminkan penyelidikan anda:

List the key words that reflects your research:

Bahasa Malaysia

Pelajar perubatan

Stail pembelajaran

Perhezaan berdasarkan ras

Perhezaan herdarkan iantina

Bahasa Inggeris

Medical Students

learning styles

race differences

gender differences

**8. Output dan Faedah Projek**

Output and Benefits of Project

**(a) \* Penerbitan Jurnal**

Publication of Journals

(Sila nyatakan jenis, tajuk, pengarang/editor, tahun terbitan dan di mana telah diterbit/diserahkan)

(State type, title, author/editor, publication year and where it has been published/submitted)

- (b) **Faedah-faedah lain seperti perkembangan produk, pengkomersialan produk/pendaftaran paten atau impak kepada dasar dan masyarakat.**  
*State other benefits such as product development, product commercialisation/patent registration or impact on source and society.*

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\* Sila berikan salinan/Kindly provide copies

- (c) **Latihan Sumber Manusia**  
*Training in Human Resources*

- i) Pelajar Sarjana: \_\_\_\_\_  
*Graduates Students*  
(Perincikan nama, ijazah dan status)  
(Provide names, degrees and status)

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- ii) Lain-lain: \_\_\_\_\_  
*Others*

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9. **Peralatan yang Telah Dibeli:**  
*Equipment that has been purchased*

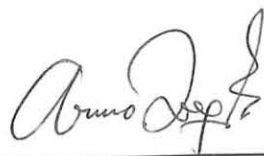
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**Tandatangan Penyelidik**  
*Signature of Researcher*

19.02.08

**Tarikh**  
*Date*

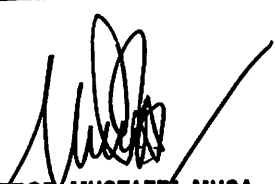
**Komen Jawatankuasa Penyelidikan Pusat Pengajian/Pusat**  
*Comments by the Research Committees of Schools/Centres*

Projek di tamatkan dgn mencapai  
objektif kajian.

Data hasil kajian diterbitkan:-

- perbincangan
- manuskrif utk diterbitkan

etc

  
**ASSOC. PROF. MUSTAFFA MUSA**  
Chairman of Research Committee  
School of Medical Sciences  
Health Campus  
Universiti Sains Malaysia

**PANDANGAN PENGURUSI**  
**JAWATANKUASA PENYELIDIKAN**  
**PUSAT PENGAJIAN/PUSAT**

*Signature of Chairman*  
*[Research Committee of School/Centre]*

16/3/08

**Tarikh**  
*Date*

**BORANG LAPORAN HASIL PENYELIDIKAN****PPSP**

Tajuk geran: *Students' Learning Style of School of Medical Sciences, Universiti Sains Malaysia*

Penyelidik: PM DR. ARUNODAYA BARMAN

Jenis geran: Short term grant

Tempoh geran: Two years

Jenis laporan: Laporan Kemajuan ☐ Alatan di beli ☐ Ya:nyatakan.....

Laporan Akhir\*: ☐ ☒ Tidak

OBJEKTIF SPESIFIK KAJIAN (sama spt dalam proposal asal)	SECARA RINGKAS TERANGKAN PENCAPAIAN/HASIL	OBJEKTIF TERCAPAI ATAU TIDAK
1. To study the pattern of learning style by gender, race and study year of undergraduate medical students of the School of Medical Sciences, Universiti Sains Malaysia	1. To study the pattern of learning style by gender, race and study year of undergraduate medical students of the School of Medical Sciences, Universiti Sains Malaysia	Acheived
2.		
3.		
4.		

- Laporan Akhir perlu disertakan salinan manuskrip dan surat yang dihantar kepada mana-mana jurnal untuk penerbitan.

Nama Penyelidik Utama (PI): PM DR. ARUNODAYA BARMAN

t.t.:

Tarikh: 19.02.08



## **Abstrak**

### **Pengenalan**

Stail pembelajaran ditakrifkan sebagai, bagaimana seseorang menyedari, berhubungan dengan, dan bertindakbalas terhadap persekitaran pembelajaran (Keefe, 1979). Oleh kerana stail pembelajaran berbeza bagi setiap individu, terdapat kemungkinan perbezaan stail pembelajaran yang besar antara satu sama lain walaupun didalam kumpulan yang spesifik.

Mengetahui stail pembelajaran pelajar boleh membantu pengajar membentuk situasi pembelajaran yang bersesuaian (Amin, 2000). Jadi adalah penting untuk mengenalpasti stail pembelajaran pelajar-pelajar untuk merangka kaedah pengajaran yang lebih berkesan untuk pelajar.

### **Metodologi**

Inventori stail pembelajaran VARK digunakan untuk mengkaji stail pembelajaran. Kesemua 988 orang penuntut perubatan tahun 1 hingga tahun 5 adalah populasi kajian. Tujuh puluh dua peratus daripada mereka memberikan maklumbalas kepada inventori stail pembelajaran tersebut.

### **Keputusan**

Daripada 713 responden, 510 daripadanya memilih satu, 148(20.76%) memilih dua, 54 (7.57%) memilih tiga dan 1(.10%) memilih empat stail pembelajaran. Majoriti pelajar melayu (24.8%) memilih stail pembelajaran membaca/menulis manakala china (26.1%) dan India (40.0%) memilih stail pembelajaran kinestetik. Peratus tertinggi (24.6%) responden perempuan memilih stail pembelajaran membaca/menulis manakala responden lelaki (25.4%) memilih stail pembelajaran kinestetik.

### **Perbincangan dan kesimpulan**

Kepelbagaian pemilihan stail pembelajaran pelajar-pelajar adalah merupakan satu cabaran kepada tenaga pengajar bagi menemui keperluan pendidikan kesemua pelajar. Pencapaian pelajar dipengaruhi oleh adaptasi stail pembelajaran tenaga pengajar. Tiga puluh peratus daripada pelajar adalah multimodal. Mereka mungkin berkebolehan belajar apa-apa cara pembelajaran yang digunakan. Sebahagian besar pelajar-pelajar telah dikenalpasti sebagai memilih satu stail pembelajaran.

Perhatian harus diambil untuk kumpulan pelajar ini apabila menyediakan bahan-bahan pengajaran untuk meningkatkan pembelajaran mereka. Hasil kajian ini akan digunakan oleh penasihat akademik apabila membincangkan keputusan kegagalan mentee mereka.



# Students' Learning Style of School of Medical Sciences, Universiti Sains Malaysia

## Summary

### Introduction

Learning style defines how a learner perceives, interacts with, and responds to the learning environment (Keefe, 1979). Learning style varies with the personality style. As learning style is individualized, there is possibility of wide variation in the learning style even in a specific group of students. Knowing students' learning style may help the teachers create an appropriate learning situation (Amin, 2000). Thus it is important to identify the learning styles of students for designing learning instruction for better performance of the students.

### Methods

VARK learning style inventory was used to explore the learning styles of medical students of Universiti Sains Malaysia. All 988 undergraduate medical students of year 1 to year 5 MD program were the study population. Seven hundred and thirteen students responded to the learning style inventory, giving a response rate of 72%..

### Results

Out of 713 respondents 510 (71.53%) preferred single, 148 (20.76%) preferred two, 54 (7.57%) preferred three and 1 (.10%) preferred four learning styles. Single majority of Malay students (24.8%) preferred read/write learning style when single majority of

Chinese (26.1%) and Indian (40.0%) preferred kinesthetic learning style. Single highest percentage (24.6%) of female respondents preferred read/write learning style when single highest percentage (25.3%) of male respondents preferred kinesthetic learning style.

### **Discussion and conclusion**

Diversity of preferred learning styles of students is a challenge for instructors to meet the educational needs of all the students (Lujan HL & DiCarlo SE, 2006). Students' performance is influenced by the adaptation of students' learning styles by the instructors (Sykes et al ,1990). Many students are able to learn effectively when a blend of instruction is provided, however, some students struggled much if the care is not taken to provide instruction on their preferred styles (Lujan et al, 2006).

Thirty percent of the students are multimodal. They may be able to learn whatever the instructional methods used. A large number of students are identified as preferring a single style of learning. Care must be taken for this group of students when developing instructional materials for enhancing their learning. This finding may be used by the mentor lecturers when discussing failing results of their mentee.

## Introduction

Learning preference refers to one's choice of a specific learning situation or environment than others (Rezler A, 1975). Learning style varies with the personality style. As personality style varies from individual to individual, learning style must be different for different individual (Blumhardt JH). As learning style is individualized there is possibility of wide variation in the learning style even in a specific group of students. This may happen in case of medical students too. A specific instructional method may work well for an individual learner but may not produce similar achievement in others. Visual learners prefer information if charts, graphs, flow charts, symbolic arrows, circles, hierarchies and other devices are used to represent words. Aural learners learn best from lectures, tutorials, tapes, group discussion, email, speaking and web chat when read/write group of learners prefer information displayed in words. Kinesthetic learners (as classified by Neil Fleming), learn best by experience and practice. Knowing students' learning styles may help the teachers to create an appropriate learning situation (Amin, 2000). Thus it is important to identify the learning style of students for designing learning instruction for better performance of the students. If students' learning styles are considered in teaching strategies, it can improve students' attitude toward learning and can increase thinking skills, academic achievement and creativity (Irvine and York, 1995). Thus it is the responsibility of the teacher to facilitate learning by using student-centred approach, that is, teaching according to students' learning style (Chang WC, 2004).

Learning style defines how a learner perceives, interacts with, and responds to the learning environment (Keefe, 1979). Kolb (1984) identifies four learning styles; accommodation, assimilation, converging and diverging. He has shown that educational specialization, career choices, personality types, and current job roles and tasks influence the learning style. There are some other classifications of learning styles. Learning style is one of the factors needed to be considered in planning curriculum and designing instructional units (Amin, 2000). “ Learning style is a biologically and developmentally imposed set of characteristics that make the same teaching method wonderful for some and terrible for others” - Dun & Dun.

At the School of Medical Sciences, Universiti Sains Malaysia different teaching-learning methods are used in its undergraduate medical program. So far, it was not explored if the teaching styles were directing towards the learning style of students. This study is intended to analyse the learning styles of students and hence help lectures to identify the appropriate instructional design.

## **Study Objective**

To study the pattern of learning style by gender and race and study year of undergraduate medical students of the School of Medical Sciences, Universiti Sains Malaysia.

## Methodology

### Study population

All 988 undergraduate medical students of year1 to year 5 were the study population.

Seventy two percent of them responded to the learning style inventory. Distribution of respondents by year of study is shown in Table 1. Participation in the study was voluntary.

**Table 1. Distribution of students by year of study**

Year of study	Frequency	Percent
Year1	147	20.6
Year2	173	24.3
Year3	91	12.8
Year4	179	25.1
Year5	123	17.3
Total	713	100.0

### Study instrument

VARK learning style inventory was used to explore the learning styles. Neil Fleming developed the VARK learning style inventory in the year 1987. Findings of this inventory categorize the learning into 4; visual, auditory, read/write and kinesthetic. There are 13 questions in the inventory each having 3 to 4 responses. All together there are 48 responses, 12 responses relating to each of the learning styles (Appendix A). The respondents are allowed to omit a question or to response two or more options if appropriate to them. The VARK learning style inventory was used because it is concise

and less time consuming to complete. It takes approximately 10 minutes for the students to complete the inventory.

### **Validity and reliability of the VARK inventory**

Statistical validation of the VARK questionnaire is difficult because of its structure.

VARK replicates how decisions are made using many preferences and the multiple answer option for each question makes statistical analysis very difficult (Fleming, 2008.

<http://www.vark-learn.com/english/page.asp?p=faq>). Reliability of the questionnaire was tested by administering the questionnaire twice to the same sample of 30 students in an interval of three months. Ninety seven percent of the respondents who was identified as having single or multiple preferred learning styles were of same style group in both of these administrations. This gives a good reliability of the questionnaire for the study group.

### **Data Collection**

A paper version of the VARK inventory was distributed directly to the students attending lectures and PBL sessions. Permission of tutors was taken before distributing the inventory to the students and the completed inventory was collected as students exited the sessions. A written consent was taken along with the inventory.

## **Data Analysis**

The responses were analysed by gender, race and year of study by using Computer package SPSS. Scores for each student were evaluated for dominant or multimodal preference using the stepping stone method suggested by Neil Fleming (Appendix B). Relationship between specific learning style and gender, race and year of study were investigated by  $\chi^2$  test.

## **Duration**

Study was carried out in the year 2007.

## **Outcome**

Findings of this study may help PPSP to rethink about the instructional design for the improvement of its students' learning.

## Results

Out of 713 respondents, 510 (71.53%) preferred single, 148 (20.76%) preferred two, 54 (7.57%) preferred three and 1 (.10%) preferred four learning styles. Highest percentage (24.4%) of the total respondents preferred read/write learning style while highest percentage of year1 (28.6%), year3 (34.1%) preferred read/write and year2 (23.7%), year4 (25.1%) and year5 (27.6%) preferred kinesthetic learning style (Table 2).

Single majority of Malay students (24.8%) preferred read/write learning style while single majority of Chinese (26.1%) and Indian (40.0%) students preferred kinesthetic learning style (Table-3).

Of the total 713 respondents, 64% were female and 34% were male students. Single highest percentage (24.6%) of female respondents preferred read/write learning style while single highest percentage (25.3%) of male respondents preferred kinesthetic learning style (Table-4).

Out of 713 respondents, 510 (64.7% Malay, 32.2% Chinese and 3.1% Indian) have preference for single learning style. Although as a whole 34.1% of the single preference respondents preferred read/write learning style, 34.5% of Malay preferred read/write style, while 38.3% of Non-Malays (Chineses and Indians) preferred kinesthetic learning style. Chi-square test (Pearson Chi-Square 16.982, df 3, .001) revealed that there is an



association of preferred learning style by race. Malay students preferred read/write while Non-Malay students preferred kinesthetic learning styles (Table-5).

Of the 510 respondents who have single learning style preference, a majority were female (65.5%). About 37% of the male and 33.5% of female students preferred kinesthetic and read/write learning styles respectively. These are the highest percentage for males and females preferring single learning style. There is a statistically significant (Pearson Chi-Square 9.566, df 3, .023) association between the preferred learning styles and the gender (Table-6).

About 39% of year 1 and 47.7% year 3 preferred read/write learning style while 35.0% of year2, 34.4% of year4 and 38.2% year5 students preferred kinesthetic learning style. There is no association between year of medical study and learning styles (Table-7).

**Table-2. Preferred learning styles by year of medical study**

Learning Styles		Year of Medical Study					Total
		Year1	Year2	Year3	Year4	Year5	
Visual	Count	20	18	9	14	17	78
	% within Year	13.6%	10.4%	9.9%	7.8%	13.8%	10.9%
Aural	Count	22	20	10	33	14	99
	% within Year	15.0%	11.6%	11.0%	18.4%	11.4%	13.9%
Read/write	Count	42	38	31	39	24	174
	% within Year	28.6%	22.0%	34.1%	21.8%	19.5%	24.4%
Kinesthetic	Count	24	41	15	45	34	159
	% within Year	16.3%	23.7%	16.5%	25.1%	27.6%	22.3%
Visual & aural	Count	3	5	1	1	3	13
	% within Year	2.0%	2.9%	1.1%	.6%	2.4%	1.8%
Visual and read/write	Count	1	1	4	5	6	17
	% within Year	.7%	.6%	4.4%	2.8%	4.9%	2.4%
Visual & kinesthetic	Count	3	6	4	12	5	30
	% within Year	2.0%	3.5%	4.4%	6.7%	4.1%	4.2%
Aural & read/write	Count	5	11	6	3	3	28
	% within Year	3.4%	6.4%	6.6%	1.7%	2.4%	3.9%
Aural & kinesthetic	Count	5	10	4	5	5	29
	% within Year	3.4%	5.8%	4.4%	2.8%	4.1%	4.1%
Read/write & kinesthetic	Count	7	10	3	6	5	31
	% within Year	4.8%	5.8%	3.3%	3.4%	4.1%	4.3%
Visual, aural & read/write	Count	7	4	0	8	4	23
	% within Year	4.8%	2.3%	.0%	4.5%	3.3%	3.2%
Visual, aural & kinesthetic	Count	1	3	0	0	0	4
	% within Year	.7%	1.7%	.0%	.0%	.0%	.6%
Visual, read/write & kinesthetic	Count	5	5	4	6	3	23
	% within Year	3.4%	2.9%	4.4%	3.4%	2.4%	3.2%
Aural, read/write & kinesthetic	Count	1	1	0	2	0	4
	% within Year	.7%	.6%	.0%	1.1%	.0%	.6%
Visual, aural, read/write & kinesthetic	Count	1	0	0	0	0	1
	% within Year	.7%	.0%	.0%	.0%	.0%	.1%
Total	Count	147	173	91	179	123	713
	% within Year	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

**Table-3. Learning styles by race of medical students**

Learning styles		Race			Total
		Malay	Chinese	Indian	
Visual	Count	46	28	4	78
	% within Race	10.0%	12.0%	20.0%	10.9%
Aural	Count	80	19	0	99
	% within Race	17.4%	8.1%	.0%	13.9%
Read/write	Count	114	56	4	174
	% within Race	24.8%	23.9%	20.0%	24.4%
Kinesthetic	Count	90	61	8	159
	% within Race	19.6%	26.1%	40.0%	22.3%
Visual & aural	Count	7	6	0	13
	% within Race	1.5%	2.6%	.0%	1.8%
Visual and read/write	Count	8	9	0	17
	% within Race	1.7%	3.8%	.0%	2.4%
Visual & kinesthetic	Count	20	8	2	30
	% within Race	4.4%	3.4%	10.0%	4.2%
Aural & read/write	Count	22	6	0	28
	% within Race	4.8%	2.6%	.0%	3.9%
Aural & kinesthetic	Count	20	9	0	29
	% within Race	4.4%	3.8%	.0%	4.1%
Read/write & kinesthetic	Count	19	10	2	31
	% within Race	4.1%	4.3%	10.0%	4.3%
Visual, aural & read/write	Count	16	7	0	23
	% within Race	3.5%	3.0%	.0%	3.2%
Visual, aural & kinesthetic	Count	3	1	0	4
	% within Race	.7%	.4%	.0%	.6%
Visual, read/write & kinesthetic	Count	10	13	0	23
	% within Race	2.2%	5.6%	.0%	3.2%
Aural, read/write & kinesthetic	Count	4	0	0	4
	% within Race	.9%	.0%	.0%	.6%
Visual, aural, read/write & kinesthetic	Count	0	1	0	1
	% within Race	.0%	.4%	.0%	.1%
Total	Count	459	234	20	713
	% within Race	100.0%	100.0%	100.0%	100.0%



**Table-4. Preferred learning style by gender of medical students**

Learning Style		Gender		Total
		Male	Female	
Visual	Count	27	51	78
	% within Gender	10.5%	11.2%	10.9%
Aural	Count	22	77	99
	% within Gender	8.6%	16.9%	13.9%
Read/write	Count	62	112	174
	% within Gender	24.1%	24.6%	24.4%
Kinesthetic	Count	65	94	159
	% within Gender	25.3%	20.6%	22.3%
Visual & aural	Count	6	7	13
	% within Gender	2.3%	1.5%	1.8%
Visual and read/write	Count	8	9	17
	% within Gender	3.1%	2.0%	2.4%
Visual & kinesthetic	Count	10	20	30
	% within Gender	3.9%	4.4%	4.2%
Aural & read/write	Count	10	18	28
	% within Gender	3.9%	3.9%	3.9%
Aural & kinesthetic	Count	11	18	29
	% within Gender	4.3%	3.9%	4.1%
Read/write & kinesthetic	Count	13	18	31
	% within Gender	5.1%	3.9%	4.3%
Visual, aural & read/write	Count	8	15	23
	% within Gender	3.1%	3.3%	3.2%
Visual, aural & kinesthetic	Count	1	3	4
	% within Gender	.4%	.7%	.6%
Visual, read/write & kinesthetic	Count	11	12	23
	% within Gender	4.3%	2.6%	3.2%
Aural, read/write & kinesthetic	Count	2	2	4
	% within Gender	.8%	.4%	.6%
Visual, aural, read/write & kinesthetic	Count	1	0	1
	% within Gender	.4%	.0%	.1%
Total	Count	257	456	713
	% within Learning_Style	36.0%	64.0%	100.0%
	% within Gender	100.0%	100.0%	100.0%

**Table-5. Preferred learning styles by race of medical students**

Race		Learning styles				Total
		Visual	Aural	Read/write	Kinesthetic	
Malay	Count	46	80	114	90	330
	% within race	13.9%	24.2%	34.5%	27.3%	100.0%
Non-Malay	Count	32	19	60	69	180
	% within race	17.8%	10.6%	33.3%	38.3%	100.0%
Total	Count	78	99	174	159	510
	% within race	15.3%	19.4%	34.1%	31.2%	100.0%
Pearson Chi-Square		16.982(a)	df 3	.001		

**Table-6. Preferred learning style by gender of medical students**

Gender		Learning styles				Total
		Visual	Aural	Read/write	Kinesthetic	
Male	Count	27	22	62	65	176 (34.5%)
	% within Gender	15.3%	12.5%	35.2%	36.9%	100.0%
Female	Count	51	77	112	94	334 (65.5%)
	% within Gender	15.3%	23.1%	33.5%	28.1%	100.0%
Total	Count	78	99	174	159	510 (100%)
	% within Gender	15.3%	19.4%	34.1%	31.2%	100.0%
Pearson Chi-Square		9.566	df 3	.023		

**Table-7. Preferred learning styles by year of study in medical school**

Year		Learning styles				Total
		Visual	Aural	Read/write	Kinesthetic	
Year1	Count	20	22	42	24	108
	% within Year	18.5%	20.4%	38.9%	22.2%	100.0%
Year2	Count	18	20	38	41	117
	% within Year	15.4%	17.1%	32.5%	35.0%	100.0%
Year3	Count	9	10	31	15	65
	% within Year	13.8%	15.4%	47.7%	23.1%	100.0%
Year4	Count	14	33	39	45	131
	% within Year	10.7%	25.2%	29.8%	34.4%	100.0%
Year5	Count	17	14	24	34	89
	% within Year	19.1%	15.7%	27.0%	38.2%	100.0%
Total	Count	78	99	174	159	510
	% within Year	15.3%	19.4%	34.1%	31.2%	100.0%
Pearson Chi-Square		20.20	df 12	.063		

## **Discussion**

One way to describe learning styles of students is to describe what their preferred mode of receiving information. Diversity of preferred learning styles of students is a challenge for instructors to meet the educational needs of all the students (Lujan HL & DiCarlo SE, 2006).

Students' performance is influenced by the adaptation of students' learning styles by the instructors (Sykes et al ,1990). Witkin et al (1977) stated that matching of students with instructional methods or teachers might facilitate students learning. Dunn (1990) said "Students are not failing because of the curriculum. Students can learn almost any subject matter when they are taught using instructional approaches responsive to their learning style strength". Matching and mismatching of learning styles and instructional styles have significant effect upon learning outcomes and this effect is very prominent in case of males (Ford & Chen, 2001).

Many students are able to learn effectively when a blend of instruction is provided. However, some students struggle much, if care is not taken to provide instruction based on their preferred learning styles (Lujan et al, 2006). Developing flexibility to deal optimally with all instructional methods would be a better alternative (Curry 1990). One single approach to teaching does not work well for every student or even most students as their ways of learning are diverse (Hawk, Shah, (2007).

Lujan et al (2006) in their study found that only 36.1% preferred a single style, Murphy et al in their study among the dental students of Temple University School of Dentistry found that 44% of students showed single dominant learning preference. In the distribution of single dominant preference, higher percentage was of visual learners while lower percentage was of kinesthetic learners. Fleming (2007) noted that 50% of the respondents were multimodal. In our study, it is found that 71.53% of the respondents preferred single learning style. These differences may be due to the respondents being over careful in perceiving the meaning of the statements in the VARK inventory and responded to the statement that most appropriately relate to their learning styles. It could also be due to cultural differences of respondents in the other study groups.

In this study it was observed that there is diversity of learning styles among the medical students. The diversity is related to the race and to the gender of the students. Read/write learning style is highly preferred by the Malay students while kinesthetic learning style is preferred by Non-Malay students. It is observed in studies that there are differences of learning styles by cultural background of the learners (Guild, 2001, Scarpaci JL, Fradd HS, 1985). Female students also prefer the read/write learning style while the male students prefer kinesthetic learning style. Baykan & Nacar (2007) did not find any difference between male and female preferences of learning styles but Fleming (2007) observed significant differences between male and female preferred learning styles. This finding may be linked to the cultural diversity of the study groups.



## **Conclusion and recommendations**

Thirty percent of the students were found to be multimodal. They may be able to learn whatever the instructional methods are used. However a large number of students are identified as preferring a single style of learning. Care must be taken for this group of students when developing instructional materials for enhancing their learning. This finding may be used by the mentor lecturers when discussing failing results of their mentees.

## **Acknowledgement**

This study was undertaken under the USM short term grant No: 304/PPSP/6131433. The authors would like to acknowledge the medical students of Universiti Sains Malaysia for their cooperation in responding to the questionnaire. We are grateful to Dr. N.D. Fleming for giving us permission to use VARK, Copyright Version 5.1 (2005) held by Neil D. Fleming, Christchurch, New Zealand and Charles C. Bonwell, Green Mountain Falls, Colorado 80819 U.S.A.

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1-64.



visual, aural, read/write, kinesthetic

## The VARK Questionnaire – English Version (version 3)

### How Do I Learn Best?

This questionnaire aims to find out something about your preferences for the way you work with information. You will have a preferred learning style and one part of that learning style is your preference for the intake and output of ideas and information.

Choose the answer which best explains your preference and circle the letter next to it. Please circle more than one if a single answer does not match your perception.

Leave blank any question which does not apply, but try to give an answer for at least 10 of the 13 questions

1. You are about to give directions to a person who is standing with you. She is staying in a hotel in town and wants to visit your house later. She has a rental car. I would:
  - a. draw a map on paper
  - b. tell her the directions
  - c. write down the directions (without a map)
  - d. collect her from the hotel in my car
2. You are not sure whether a word should be spelled 'dependent' or 'dependant'. I would:
  - a. look it up in the dictionary.
  - b. see the word in my mind and choose by the way it looks
  - c. sound it out in my mind.
  - d. write both versions down on paper and choose one.
3. You have just received a copy of your itinerary for a world trip. This is of interest to a friend. I would:
  - a. phone her immediately and tell her about it.
  - b. send her a copy of the printed itinerary.
  - c. show her on a map of the world.
  - d. share what I plan to do at each place I visit.
4. You are going to cook something as a special treat for your family. I would:
  - a. cook something familiar without the need for instructions.
  - b. thumb through the cookbook looking for ideas from the pictures.
  - c. refer to a specific cookbook where there is a good recipe.
5. A group of tourists has been assigned to you to find out about wildlife reserves or parks. I would:
  - a. drive them to a wildlife reserve or park.
  - b. show them slides and photographs
  - c. give them pamphlets or a book on wildlife reserves or parks.
  - d. give them a talk on wildlife reserves or parks.

6. You are about to purchase a new stereo. Other than price, what would most influence your decision?
- the salesperson telling you what you want to know.
  - reading the details about it.
  - playing with the controls and listening to it.
  - it looks really smart and fashionable.
7. Recall a time in your life when you learned how to do something like playing a new board game. Try to avoid choosing a very physical skill, e.g. riding a bike. I learnt best by:
- visual clues -- pictures, diagrams, charts
  - written instructions.
  - listening to somebody explaining it.
  - doing it or trying it.
8. You have an eye problem. I would prefer the doctor to:
- tell me what is wrong.
  - show me a diagram of what is wrong.
  - use a model to show me what is wrong.
9. You are about to learn to use a new program on a computer. I would:
- sit down at the keyboard and begin to experiment with the program's features.
  - read the manual which comes with the program.
  - telephone a friend and ask questions about it.
10. You are staying in a hotel and have a rental car. You would like to visit friends whose address/location you do not know. I would like them to:
- draw me a map on paper.
  - tell me the directions.
  - write down the directions (without a map).
  - collect me from the hotel in their car.
11. Apart from the price, what would most influence your decision to buy a particular textbook?
- I have used a copy before.
  - a friend talking about it.
  - quickly reading parts of it.
  - the way it looks is appealing.
12. A new movie has arrived in town. What would most influence your decision to go (or not go)?
- I heard a radio review about it
  - I read a review about it.
  - I saw a preview of it.
13. Do you prefer a lecturer or teacher who likes to use?
- a textbook, handouts, readings
  - flow diagrams, charts, graphs.
  - field trips, labs, practical sessions.
  - discussion, guest speakers.

### Scoring Instructions

Because respondents can choose more than one answer for each question the scoring is complex. It can be likened to a set of four stepping-stones across water.

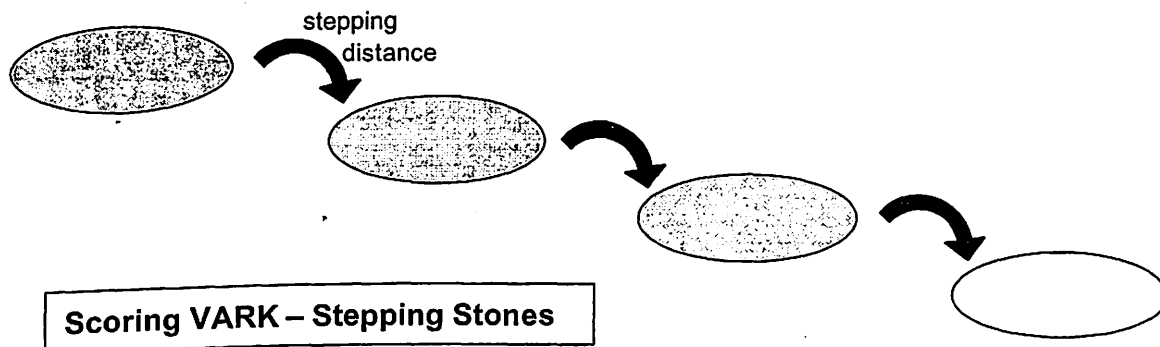
1. Add up your scores,  $V + A + R + K =$

total

2. Enter your scores from highest to lowest on the stones below, with their V, A, R, and K labels.
3. Your stepping distance comes from this table.

Total of my four VARK scores is	My stepping distance is
10-16	1
17-22	2
23-26	3
More than 26	4

3. Your first preference is your highest score so tick (check) the first stone as one of your preferences and enter its label on the stone.
4. If you can reach the next stone with a step equal to or less than your stepping distance then tick (check) that one too.



Once you cannot reach the next stone you have finished defining your set of preferences.

If you have more than one preference ticked you should read the material on **multimodal** preferences.  
If you have checked only the first stone go to the help sheet for that **single** preference.



visual | aural | read/write | kinesthetic

## The VARK Questionnaire – English Version Scoring Chart

Use the following scoring chart to find the VARK category that each of your answers corresponds to. Circle the letters that correspond to your answers

e.g. If you answered b and c for question 3, circle R and V in the question 3 row.

Question	a category	b category	c category	d category
3	A	R	V	K

### Scoring Chart

Question	a category	b category	c category	d category
1	V	A	R	K
2	R	V	A	K
3	A	R	V	K
4	K	V	R	
5	K	V	R	A
6	A	R	K	V
7	V	R	A	K
8	A	V	K	
9	K	R	A	
10	V	A	R	K
11	K	A	R	V
12	A	R	V	
13	R	V	K	A

### Calculating your scores

Count the number of each of the VARK letters you have circled to get your score for each VARK category.

Total number of **V**s circled =

Total number of **A**s circled =

Total number of **R**s circled =

Total number of **K**s circled =

### Calculating your preferences

Use the “Scoring Instructions” sheet (available in the “advice to teachers” section of the VARK web site) to work out your VARK learning preferences.



# VARK

visual aural read/write kinesthetic

## For those with a Single Preference:

If you have a single preference (V, A, R or K) you may want to find out if your preference is mild or strong or very strong. You can use the table below to find out.

- You will need to use your total number of your responses (from step 1 above). This is used for finding your place in Column One. Place a ruler on your line in Column One.
- Now you will need to know the difference between your highest score and your next highest score. Read across your line until you reach the column that shows the difference between your highest and your next highest scores.

Column 1	The difference between my two highest scores was:						
My Total Number of responses is:	Zero. They were equal	1	2	3	4	5	6 or more
less than 17	Multi-modal	Multi-modal	Mild	Strong	Very Strong	Very Strong	Very Strong
between 17 and 22	Multi-modal	Multi-modal	Multi-modal	Mild	Strong	Very Strong	Very Strong
between 23 and 26	Multi-modal	Multi-modal	Multi-modal	Multi-modal	Mild	Strong	Very Strong
more than 26	Multi-modal	Multi-modal	Multi-modal	Multi-modal	Multi-modal	Mild	Strong

## Result

The strength of my single preference is:		
Mild	Strong	Very strong

**From:** Neil Fleming [mailto:flemingn@ihug.co.nz]

**Appendix C**

**Sent:** Wednesday, May 10, 2006 1:48 PM

**To:** barman@kb.usm.my

**Subject:** VARK and Copyright

Dear Dr. Arunodaya Barman

Thank you for seeking permission to use VARK. We have to rely on the honesty of people to act in a professional way when using our copyright materials. You are welcome to use the VARK materials from a link online, or in paper format, for your medical students, providing suitable acknowledgment is made. This is what we prefer:

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You may not provide an open-access Internet site with VARK copyright materials on it.

You may be interested in a new VARK service starting soon. We will soon be able to capture the VARK scores for your work team, colleagues, your class or your classes. These results will be readily available to you for a small charge and you will have your own password for access. You may also purchase a description of your team/class profile.

Personal profiles are proving popular. After completion of the questionnaire online, you can request a personal learning profile incorporating advice about the learning strategies that would be most helpful for you. A follow up email discussion about your learning is also available.

You may find the two VARK books (student and faculty) helpful for your work. There is also a book that teachers are finding very useful for encouraging active learning in class and for widening their repertoire of classroom strategies. It is titled - 55 Strategies for Teaching and has 55 one-page practical ideas.

VARK principles can be applied equally well to coaching athletes and sports players and there is a new book that details how to do this, titled *Sports Coaching and Learning*. It is available from our secure website at [www.vark-learn.com](http://www.vark-learn.com).

Bona fide trainers should consider using the VARK Trainers' Resource Kit and purchasing a lifetime licence to use the copyrighted VARK materials with a once-only fee. We also have a VARK PowerPoint presentation available.

There is VARK software that allows you to capture and use the data from your own students on your own intranet. If you want to use it, the site must be password protected.

To purchase any of these resources (above) you can use a personal check/cheque, an institutional Purchase Order and check/cheque or buy from our secure website with a credit card.

Best wishes for your work.

Neil

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# Manuscript

**P.M. Dr Arunodaya Barman**

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**From:** Editor@Med-Ed-Online.org  
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Dear Dr. Arunodaya Barman,

Thank you for choosing MEO for submitting your manuscript. We are generally able to review manuscripts and provide feedback to authors within about six weeks.

Submission received:

Submission ID: Res00268

Title: Medical Students' learning styles in Universiti Sains Malaysia

Section Request: Research

Key Words: Learning theory, Medical Students, learning styles, race differences, gender differences

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Conflict of interest - no

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## **Appendix D**

### **Medical Students' learning styles in Universiti Sains Malaysia**

**Arunodaya Barman, Rogayah Jaafar**

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## **Abstract**

**Introduction:** Learning style defines how a learner perceives, interacts with, and responds to the learning environment (Keefe, 1979). As learning style is individualized there is possibility of wide variation in the learning style even in a specific group of students. Knowing students' learning style may help the teachers to create an appropriate learning situation (Amin, 2000). Thus it is important to identify the learning style of students for designing learning instruction for better performance of the students. **Methods:** VARK learning style inventory was used to explore the learning styles. All 988 undergraduate medical students of year1 to year 5 were the study population. Seventy two percent of them responded to the learning style inventory. **Results:** Out of 713 respondents 510 (71.53%) preferred single, 148 (20.76%) preferred two, 54 (7.57%) preferred three and 1 (.10%) preferred four learning styles. Single majority of Malay students (24.8%) preferred read/write learning style when single majority of Chinese (26.1%) and Indian (40.0%) preferred kinesthetic learning style. Single highest percentage (24.6%) of female respondents preferred read/write learning style when single highest percentage (25.3%) of male respondents preferred kinesthetic learning style. **Discussion and conclusion:** Diversity of preferred learning styles of students is a challenge for instructors to meet the educational needs of all the students. Students' performance is influenced by the adaptation of students' learning styles by the instructors. Thirty percent of the students are multimodal. They may be able to learn whatever the instructional methods are used. A large number of students are identified as preferring a single style of learning. Care may be taken for this group of students when developing instructional materials for enhancing their learning. This finding may be used by the mentor lecturers when discussing failing results of their mentis.

**Key words:** Medical Students, learning styles, race differences, gender differences

## **Introduction**

Learning preference refers to one's choice of a specific learning situation or environment than others (Rezler A, 1975). Learning style varies with the personality style. As personality style varies from individual to individual, learning style will be different for different individuals (Blumhardt JH). As learning style is individualized there is possibility of wide variation in the learning style even in a specific group of students. This may happen in case of medical students too. A specific instructional method may work well for an individual learner but may not produce similar achievement in others. Visual learners prefer information if charts, graphs, flow charts, symbolic arrows, circles, hierarchies and other devices are used to represent words. Aural learners learn best from lectures, tutorials, tapes, group discussion, email, speaking and web chat when read/write group of learners prefer information displayed in words. Kinesthetic learners as classified by Neil Fleming learn best by experience and practice. Knowing students' learning styles help the teachers to create an appropriate learning situation (Amin, 2000). Thus it is important to identify the learning style of students for designing learning instruction for better performance of the students. If students' learning styles are considered in teaching strategies, it can improve students' attitude toward learning and can increase thinking skills, academic achievement and creativity (Irvine and York, 1995). Thus it is the responsibility of the teacher to facilitate learning by using student-centred approach, that is, teaching according to students' learning style (Chang WC, 2004).

Learning style defines how a learner perceives, interacts with, and responds to the learning environment (Keefe, 1979). Kolb (1984) identifies four learning styles; accommodation, assimilation, converging and diverging. He has shown that educational specialization, career choices, personality types, and current job roles and tasks influence the learning style. There

are some other classifications of learning styles. Learning style is one of the factors needed to be considered in planning curriculum and designing instructional units (Amin, 2000).

“ Learning style is a biologically and developmentally imposed set of characteristics that make the same teaching method wonderful for some and terrible for others” - Dun & Dun.

At the School of Medical Sciences, Universiti Sains Malaysia different teaching-learning methods are used in its undergraduate medical program. So far, it was not explored if the teaching styles were directing towards the learning style of students. This study is intended to analyse the learning styles of students and hence help lectures to identify the appropriate instructional design.

### **Methodology**

All 988 undergraduate medical students of year 1 to year 5 were the study population. Seventy two percent of them responded to the learning style inventory. Participation in the study was voluntary. VARK learning style inventory-English version (version 3) was used to explore the learning styles. Neil Fleming has developed the VARK learning style inventory in the year 1987. Findings of this inventory categorize the learning into 4; visual, auditory, read/write and kinesthetic. There are 13 questions in the inventory each having 3 to 4 responses. All together there are 48 responses, 12 responses relating to each of the learning styles. The respondents are allowed to omit a question or to response two or more options if appropriate to them. The VARK learning style inventory was used because it is concise and less time consuming to complete. It takes approximately 10 minutes for the students to complete the inventory. A paper version of the VARK inventory was distributed directly to the students attending lecture and PBL session. Permission of tutors was taken before



distributing the inventory to the students and the completed inventory was collected as students exited the sessions. A written consent was taken along with the inventory. The responses were analysed by gender, race and year of study by using Computer package SPSS. Scores for each student were evaluated for dominant or multimodal preference using the stepping stone method suggested by Neil Flaming. Relation between specific learning style and gender, race and study of year were investigated by  $\chi^2$  test. Study was carried out in the year 2007.

## Results

Out of 713 respondents 510 (71.53%) preferred single, 148 (20.76%) preferred two, 54 (7.57%) preferred three and 1 (.10%) preferred four learning styles. Highest percentage (24.4%) of the total respondents preferred read/write learning style while highest percentage of year1 (28.6%), year3 (34.1%) preferred read/write and year2 (23.7%), year4 (25.1%) and year5 (27.6%) preferred kinesthetic learning style.

Single majority of 24.8% Malay students preferred read/write learning style while single majority of 26.1% Chinese and 40.0% Indian students preferred kinesthetic learning style.

Of the total 713 respondents 64% were female and 34% were male students. Single highest percentage (24.6%) of female respondents preferred read/write learning style while single highest percentage (25.3%) of male respondents preferred kinesthetic learning style.

Out of 713 respondents, 510 (64.7% Malay, 32.2% Chinese and 3.1% Indian) have preference for single learning style. Although as a whole 34.1% of the single preference respondents preferred read/write learning style, 34.5% of Malay preferred read/write style, while 38.3% of Non-Malays (Chineses and Indians) preferred kinesthetic learning style. Chi-square test (Pearson Chi-Square 16.982, df 3, .001) revealed that there is an association of preferred learning style by race. Malay students preferred read/write while Non-Malay students preferred kinesthetic learning styles (Table-1).

Of the 510 respondents who have single learning style preference, a majority were female (65.5%). About 37% of the male and 33.5% of female students preferred kinesthetic and

read/write learning styles respectively. These are the highest percentage for males and females preferring single learning style. There is a statistically significant (Pearson Chi-Square 9.566, df 3, .023) association between the preferred learning styles and the gender (Table-2).

About 39% of year 1 and 47.7% year 3 preferred read/write learning style while 35.0% of year2, 34.4% of year4 and 38.2% year5 students preferred kinesthetic learning style. There is no association between year of medical study and learning styles (Table-3).

## **Discussion**

One way to describe learning styles of students is to describe what their preferred mode of receiving information. Diversity of preferred learning styles of students is a challenge for instructors to meet the educational needs of all the students (Lujan HL & DiCarlo SE, 2006).

Students' performance is influenced by the adaptation of students' learning styles by the instructors (Sykes et al ,1990). Witkin et al (1977) stated that matching of students with instructional methods or teachers might facilitate students learning. Dunn (1990) said "Students are not failing because of the curriculum. Students can learn almost any subject matter when they are taught using instructional approaches responsive to their learning style strength". Matching and mismatching of learning styles and instructional styles have significant effect upon learning outcomes and this effect is very prominent in case of males (Ford & Chen, 2001).

Many students are able to learn effectively when a blend of instruction is provided. However, some students struggle much, if care is not taken to provide instruction based on their preferred learning styles (Lujan et al, 2006). Developing flexibility to deal optimally with all instructional methods would be a better alternative (Curry 1990). One single approach to teaching does not work well for every student or even most students as their ways of learning are diverse (Hawk, Shah, (2007).

Lujan et al (2006) in their study found that only 36.1% preferred a single style, Murphy et al in their study among the dental students of Temple University School of Dentistry found that 44% of students showed single dominant learning preference. In the distribution of single dominant preference, higher percentage was of visual learners while lower percentage was of kinesthetic learners. Fleming (2007) noted that 50% of the respondents were multimodal. In our study, it is found that 71.53% of the respondents preferred single learning style. These differences may be due to the respondents being over careful in perceiving the meaning of the statements in the VARK inventory and responded to the statement that most appropriately relate to their learning styles. It could also be due to cultural differences of respondents in the other study groups.

In this study it was observed that there is diversity of learning styles among the medical students. The diversity is related to the race and to the gender of the students. Read/write learning style is highly preferred by the Malay students while kinesthetic learning style is preferred by Non-Malay students. It is observed in studies that there are differences of learning styles by cultural background of the learners (Guild, 2001, Scarpaci JL, Fradd HS, 1985). Female students also prefer the read/write learning style while the male students

prefer kinesthetic learning style. Baykan & Nacar (2007) did not find any difference between male and female preferences of learning styles but Fleming (2007) observed significant differences between male and female preferred learning styles. This finding may be linked to the cultural diversity of the study groups.

### **Conclusion and recommendations**

Thirty percent of the students were found to be multimodal. They may be able to learn whatever the instructional methods are used. However a large number of students are identified as preferring a single style of learning. Care must be taken for this group of students when developing instructional materials for enhancing their learning. This finding may be used by the mentor lecturers when discussing failing results of their mentees.

### **Acknowledgement**

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**Table-1. Preferred learning styles by race**

Race		Learning styles				Total
		Visual	Aural	Read/write	Kinesthetic	
Malay	Count % within race	46 13.9%	80 24.2%	114 34.5%	90 27.3%	330 100.0%
Non-Malay	Count % within race	32 17.8%	19 10.6%	60 33.3%	69 38.3%	180 100.0%
Total	Count % within race	78 15.3%	99 19.4%	174 34.1%	159 31.2%	510 100.0%
Pearson Chi-Square		16.982(a)	df 3	.001		



**Table-2. Preferred learning style by gender of medical students**

Gender		Learning styles				Total
		Visual	Aural	Read/write	Kinesthetic	
Male	Count	27	22	62	65	176 (34.5%)
	% within Gender	15.3%	12.5%	35.2%	36.9%	100.0%
Female	Count	51	77	112	94	334 (65.5%)
	% within Gender	15.3%	23.1%	33.5%	28.1%	100.0%
Total	Count	78	99	174	159	510 (100%)
	% within Gender	15.3%	19.4%	34.1%	31.2%	100.0%
Pearson Chi-Square		9.566	df 3	.023		

**Table-3. Preferred learning styles by year of study in medical school**

Year		Learning styles				Total
		Visual	Aural	Read/write	Kinesthetic	
Year1	Count % within Year	20 18.5%	22 20.4%	42 38.9%	24 22.2%	108 100.0%
Year2	Count % within Year	18 15.4%	20 17.1%	38 32.5%	41 35.0%	117 100.0%
Year3	Count % within Year	9 13.8%	10 15.4%	31 47.7%	15 23.1%	65 100.0%
Year4	Count % within Year	14 10.7%	33 25.2%	39 29.8%	45 34.4%	131 100.0%
Year5	Count % within Year	17 19.1%	14 15.7%	24 27.0%	34 38.2%	89 100.0%
Total	Count % within Year	78 15.3%	99 19.4%	174 34.1%	159 31.2%	510 100.0%
Pearson Chi-Square		20.20	df 12	.063		

UNIVERSITI SAINS MALAYSIA  
JABATAN BENDAHARI  
KUMPULAN WANG PENYELIDIKAN GERAN USM(304)  
PENYATA PERBELANJAAN SEHINGGA 31 JANUARI 2008

Jumlah Geran:	RM	3,089.00	Ketua Projek: PROF(M) ARUNODAYA BARMAN
Peruntukan 2005 (Tahun 1)	RM	0.00	Tajuk Projek: Students' Learning Style of School of Medical Sciences, Universiti Sains Malaysia
Peruntukan 2006 (Tahun 2)	RM	1,544.00	
Peruntukan 2007 (Tahun 3)	RM	0.00	Tempoh: 01 Apr 04- 31 Mac 08
			No.Akaun: 304/PPSP/6131433

Kwg	Akaun	PTJ	Projek	Donor	Peruntukan Projek	Perbelanjaan Tkumpul Hingga Tahun Lalu	Peruntukan Semasa	Tanggungan Semasa	Bayaran Tahun Semasa	Belanja Tahun Semasa	Baki Projek
304	11000	PPSP	6131433		-	-	-	-	-	-	-
304	14000	PPSP	6131433		-	-	-	-	-	-	-
304	15000	PPSP	6131433		-	-	-	-	-	-	-
304	21000	PPSP	6131433		-	-	-	-	-	-	-
304	22000	PPSP	6131433		-	-	-	-	-	-	-
304	23000	PPSP	6131433		-	-	-	-	-	-	-
304	24000	PPSP	6131433		-	-	-	-	-	-	-
304	25000	PPSP	6131433		-	-	-	-	-	-	-
304	26000	PPSP	6131433		-	-	-	-	-	-	-
304	27000	PPSP	6131433		1,544.00	212.00	1,332.00	-	-	-	1,332.00
304	28000	PPSP	6131433		-	-	-	-	-	-	-
304	29000	PPSP	6131433		-	275.00	(275.00)	-	-	-	(275.00)
304	32000	PPSP	6131433		-	-	-	-	-	-	-
304	35000	PPSP	6131433		-	-	-	-	-	-	-
304	A11102	PPSP	6131433		-	-	-	200.00	-	200.00	(200.00)
					1,544.00	487.00	1,057.00	200.00	-	200.00	857.00